

Land Use Affects Public Health

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HISTORY/BACKGROUND

Environmental interventions once played a vital role in public health. The infectious diseases of the nineteenth century were controlled by public health professionals only with the help of local city planners and engineers who improved water and sewage systems and separated incompatible land uses.¹ At the present time, local planners and engineers do not see partnerships with the public health community as part of their roles, but there is an urgent need to revive those partnerships—not so much to address infectious diseases as to address chronic diseases. In the twentieth century, unhealthy lifestyles gave rise to chronic illnesses that quickly surpassed infectious disease as a major cause of death and disability. Not understanding the impact of the built environment on chronic disease, the planning and public health professions lost their common focus.² Authors Jackson and Kochtitzky state, “The diseases of the twenty-first century ... steal vitality and productivity and consume time and money. These diseases—heart disease, diabetes, obesity, asthma and depression—are diseases that can be modified by how we design and build our human environment.”³

Intervening on the human built environment is a new concept for today's public health professionals, who have historically addressed chronic illnesses through individual behavior-change programs, ignoring the environment's role. The authors of a white paper prepared for the Robert Wood Johnson Foundation state, “A critical revelation as we enter the twenty-first century is that lifestyle is the product of individual behavior choices and the environments we collectively create.” They further state, “As it once did to combat infectious disease, the scope of public health must expand to include the environments that contribute to chronic disease and poor health status in general in order to improve the health and quality of life.”⁴

¹ Gretchen Torres, Williams, MPP, Mary Pittman, DRPH, Marla Hollander, MPH, M. Katherine Kraft, PhD, Else Henry, MPH. Active Living Through Community Design: A White Paper Prepared for the Robert Wood Johnson Foundation. February 2001.

² Torres et al., 2001

³ Richard Jackson, MD, MPH, and Chris Kochtitzky, MSP, MPH. Creating a Healthy Environment: The Impact of the Built Environment on Public Health. *Planning & Zoning News*, January 2002.

⁴ Torres et al., 2001.

MODERN HEALTH PROBLEMS LINKED TO PHYSICAL INACTIVITY

Obesity

The nation is experiencing an obesity epidemic and Michigan consistently ranks among the heaviest states in the nation. The 2000 Behavioral Risk Factor Surveillance System (BRFSS) indicated that 62 percent of adults in Michigan are overweight and/or obese, a rate that's tied with Alabama for first in the nation. In addition, the prevalence of overweight children has tripled over the last 20 years. Obesity, in turn, increases the risk of diabetes, cardiovascular disease and some cancers. There has been a 10-fold increase in Type-2 (also known as adult-onset) diabetes among children between 1982 and 1994.⁵ In adults, obesity can increase the risk of Type 2 diabetes by as much as 34-fold and diabetes is a major risk factor for amputations, blindness, kidney failure and heart disease.⁶ As for cancer, a new study published in the New England Journal of Medicine states that overweight and obesity might account for 20 percent of all cancer deaths in U.S. women and 14 percent in U.S. men. "That means 90,000 cancer deaths could be prevented each year if Americans could only maintain a normal, health body weight."⁷ These researchers found that the heaviest men in the study had 52 percent higher death rates from all cancers combined than those of normal-weight men. The heaviest women had cancer death rates 62 percent higher than normal-weight women.⁸

Physical Activity is Powerful Prevention

The 1996 U.S. Surgeon General Report, *Physical Activity and Health* concluded that more than 200,000 deaths per year are attributable to sedentary lifestyles, the equivalent of approximately 25 percent of all deaths from chronic disease and 10 percent of all deaths in the United States.⁹ Sedentary lifestyles are linked to cardiovascular disease, hypertension, obesity, osteoporosis, and some cancers, making physical inactivity second only to smoking as a lifestyle risk factor for disease and premature death. On the other hand, the benefits of daily physical activity include:

- Improved weight control
- Reduced risk of heart disease, hypertension, colon cancer, osteoporosis, arthritis, and non-insulin dependent diabetes
- Improved blood cholesterol levels
- Prevention and treatment of high blood pressure
- Prevention of bone loss
- Increased energy levels
- Reduced stress and tension
- Improved quality of sleep
- Improved self-image

⁵ James O Hill, Holly R. Wyatt, George W. Reed and John C. Peters. Obesity and the Environment: Where Do We Go From Here? www.sciencemag.org.

⁶ Jackson and Kochtitzky, 2002

⁷ American Cancer Society. Excess Weight Linked to 90,000 US Cancer Deaths Annually: Most Types of Cancers Affected By Weight. 04/23/2003. http://www.cancer.org/docroot/nws/content/NWS_1_Ix_Excess_Weight_Linked_to_90000_US_Cancer_Deaths_Annually.asp.

⁸ American Cancer Society, 2003.

⁹ USDHHS. *Physical Activity and Health: A Report of the Surgeon General*; 1996.

- Improved mood (counters anxiety and depression and increases optimism)
- Increased muscle strength
- Prevention (or delay) of chronic illness and diseases associated with aging and increased years of independence at the end of life.¹⁰

With such benefits to physical activity, why are so many people inactive? Part of the answer lies in the way we have constructed the environments in which we live. Jackson points to one answer by saying, “There is a connection...between the fact that the urban sprawl we live with daily makes no room for sidewalks or bike paths and the fact that we are an overweight, heart disease-ridden society.”¹¹

LAND USE AND TRANSPORTATION PATTERNS AFFECT PHYSICAL ACTIVITY

The patterns of family life have changed with improved technology to the point that physical activity has been engineered out of our lives. No longer do we have to hunt and gather for our food, cut wood or wash clothes by hand, pump water from a well, etc. Elevators, escalators, riding lawn mowers, automatic dishwashers, electric pencil sharpeners and more require little energy to carry out daily tasks. Furthermore, the increasing amount of time we spend behind the wheels of our automobiles is a primary factor leading to our inactivity – a factor that is directly related to land use.

Urban Sprawl Keeps Us in Our Cars

The U.S. Department of Agriculture recently identified Michigan as one of the fastest sprawling states in the United States. While Michigan’s population grew less than 5 percent over a five-year period, the amount of urbanized land increased by 29 percent.¹² In the last decade, the number of miles driven annually in Michigan grew four times faster than the state’s population. In fact, Michigan motorists will drive nearly 100 *billion* miles this year.¹³ It is not surprising that 89 percent of our trips are made by the automobile. In 20 years, foot travel dropped 42 percent for adults. Children’s walking and biking trips to school dropped 40 percent in 20 years.¹⁴ Today, one out of every four trips is short (one mile or less) and yet 75 percent of the time they are made with an automobile.

Older Neighborhood Designs Encourage Walking

Walking is more common, however, in neighborhoods with older homes. Residents of homes built before 1974 walk more often than those who live in new homes.¹⁵ Results of a study in South Carolina also showed that age of a school building was related to the percentage of active youth commuters. “Students are four times more likely to walk to schools built before 1983 than those

¹⁰ W. C. Wilkinson, N. Eddy, G. MacFadden, and B. Burgess. *Increasing Physical Activity through Community Design: A Guide for Public Health Practitioners*. Washington: National Center for Bicycling & Walking; 2002.

¹¹ Jackson and Kochtitzky, 2002.

¹² Michigan Land Use Institute. Fact Sheet #4. *Community Involvement: Michigan Citizens Gain a Voice in Transportation and Land Use Decisions*.

¹³ Michigan Land Use Institute’s Fact Sheet #1. *We Can’t Build Our Way Out of Congestion: Michigan Can Solve Traffic Problems with Alternatives to Driving*.

¹⁴ Richard E. Killingsworth and Jean Lamming. Development and Public Health: Could Our Development Patterns be Affecting Our Personal Health? *Urban Land*, July 2001.

¹⁵ David Berrigan, PhD, Richard P. Troiano, PhD. The Association Between Urban Form and Physical Activity in U.S. Adults. *American Journal of Preventive Medicine*, Supplemental, August 2002 (74–9).

built more recently.”¹⁶ Jackson and Kochtitzky state that “While older cities and towns were planned and built based on the practical idea that stores and services should be within walking distance of residences, the design of (newer) residential areas reflects the supposition that people will drive to most destinations. Work home, school and shopping are often separated by distances that not only discourage walking, but may even necessitate the use of the car in order to reach any destination safely.”¹⁷

Newer Urban Forms Discourage Walking

Many characteristics of newer urban development discourage physical activity. Fragmented and segregated land use, low-density residential developments, lack of connectivity between neighborhoods and other points of destination, lack of pedestrian and bicycle infrastructure (sidewalks, bike lanes, etc.) and strip commercial development with large front parking lots, are but a few examples. In newer communities, very few children are able to walk or bike to school. This is largely due to trends of siting new buildings away from neighborhood centers. The National Trust for Historic Preservation attributes huge acreage standards as a major contributor to school-location decisions.¹⁸ Research has demonstrated that suburban residents drive twice as far, walk and cycle one-third as often, consume twice as much energy and produce twice as much air pollution as their urban counterparts who live where land use tends to be mixed.

LAND USE AND TRANSPORTATION PLANNING CAN PREVENT INJURIES

More Driving Means More Automobile Crashes

The more Michigan residents drive, the greater their odds for some type of crash, be it involving a single motor vehicle, multiple vehicles, pedestrians and/or bicyclists. Nationally, automobile crashes are the leading cause of death among those 24 years old and younger and they account for 3.4 million nonfatal injuries annually in this age group.¹⁹ In Michigan, 2/3 of the 971 deaths from injuries that occurred in 2000 among citizens age 1-34 were due to motor vehicle crashes.²⁰

Many factors including seat belt use, excessive speed and alcohol consumption must be considered in analyzing crash causality. However, the urban sprawl that keeps us in our cars is one of the contributing factors. While the relationship between sprawl and motor vehicle crashes is complex, Frumkin states, “At the simplest level, more driving means greater exposure to the dangers of the road, translating to a higher probability of a motor vehicle crash. Suburban roads may be a particular hazard, especially major commercial thoroughfares and ‘feeder’ roads that combine high speed, high traffic volume and frequent ‘curb cuts’ for drivers to use in entering and exiting stores and other destinations.”²¹

¹⁶ Jackson and Kochtitzky, 2002 (9).

¹⁷ Ibid.

¹⁸ Funders’ Network, 2003.

¹⁹ Howard Frumkin, MD, DrPH. Urban Sprawl Public Health. *Public Health Reports*, Vol. 117, May–June 2002 (201–17).

²⁰ National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. *Leading Causes of Death Reports*. www.cdc.gov/ncip/wisqars.

²¹ Frumkin, 2002.

Sprawl Spawns Road Rage

Road rage fatalities, for example, are directly proportional to traffic congestion and are a factor in 56 percent of all fatal crashes. Handy, et.al, states, that road rage “is highest in areas with sprawl development, where transit is limited or nonexistent and reliance on the automobile predominates. It is lowest in areas with gridded street patterns, sidewalks, and low amounts of driving per person.”²²

Poor Road Designs Are Lethal for Pedestrians and Cyclists

Unsafe roads discourage people from walking or cycling for transportation and therefore create barriers to physical activity and improved health. For those who do chose to (or must) walk or bike in these environments, they literally take their life in their hands in order to get to their destination (i.e. work, health care provider, etc.).

Pedestrians are 36 times more likely to die in a collision than drivers.²³ Nearly one in seven traffic related deaths involves a pedestrian or bicyclist. Although walking accounts for only 6 percent of all trips, 13 percent of all traffic fatalities occur among pedestrians. Furthermore, the most vulnerable populations are those most likely to be killed, our children and the elderly. While only 13 percent of the population is elderly, 22 percent of pedestrian fatalities were older than 65 years of age.²⁴ Cyclists accounted for 2 percent of traffic fatalities, disproportionate to the percentage of trips made by bicycle, and approximately one-third of cyclists killed were children from five to 15 years old.²⁵

Michigan can be a dangerous place for pedestrians. In fact, the National Highway Traffic Safety Administration (NHTSA) released a major research report in 2003 listing Detroit as having the highest pedestrian fatality rates among large U.S. cities. Among the report’s key findings about pedestrian deaths were: 78 percent occur at nonintersections, 44 percent occur on roadways without crosswalks, and 64 percent occur on urban roadways.²⁶

Most Vulnerable Citizens Are Impacted the Most

These findings are of particular concern considering the fact that nearly one-third of Michigan residents don’t drive, either because they’re too young, too old, physically unable or can’t afford a car.²⁷ This group, then, cannot move safely or easily around the community. Access to jobs, health care, social services and other basic needs are restricted or unattainable.

LAND USE AND TRANSPORTATION PLANNING AFFECT RESPIRATORY HEALTH

Motor Vehicles Cause Air Pollution

Just as levels of obesity and diabetes are rising, respiratory disease, especially asthma, is increasing yearly in the U.S. population. Designing communities to reduce automobile dependence would also improve air quality and positively impact the levels of respiratory illnesses. With Michigan

²² Susan L. Handy, PhD, Marlon G. Boarnet, PhD, Reed Ewing, PhD, Richard Killingsworth, MPH. How the Built Environment Affects Physical Activity: Views From Urban Planning. *American Journal of Preventive Medicine*, Supplement, August 2002 (64–73).

²³ Funders’ Network, 2003.

²⁴ Jackson and Kochtitzky, 2002.

²⁵ Funders’ Network, 2003.

²⁶ <http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/Rpts/2003/809-456.pdf>.

²⁷ Michigan Land Use Institute. Fact Sheet #3. *Ten Percent for People: Effective Investment in Public Transportation*.

residents driving billions of miles each year, air quality is a major concern. Motor vehicles are a leading source of air pollution. Despite improvements in technology and regulatory interventions, the exponential growth in number of vehicles on the road and miles driven continue to contribute to the problem.

Nationally, travel emissions now account for 61 percent of all CO emissions, and motor vehicles account for 94 percent of travel emissions. Motor vehicles also account for approximately 30 percent of NO₂ and VOC emissions.²⁸ In the Funders' Network Translation Paper *Health and Smart Growth*, the authors state, "The health effects of mobile-source related air pollutants include respiratory and cardiopulmonary problems, headaches, reduced learning ability, and premature mortality. Ambient air pollutants including O₃, SO₂, NO₂, acid aerosols, and particulate matter are associated with aggravation of asthma and decreases in lung function."²⁹ Frumkin states, "People who are especially susceptible to the effects of air pollution include the elderly, the very young and those with underlying cardiopulmonary disease."³⁰ Exposure to particulate air pollution can not only decrease quality of life, but it can also shorten life by months or years, according to Frumkin.

Motor Vehicles and Asthma

The number of people with asthma in the U.S. increased by 102 percent from 1980 to 1994. In Michigan, 215,000 children and 646,000 adults are affected by asthma.³¹ Furthermore, there is a direct relationship between increasing levels of ozone and increases in respiratory-related emergency room visits and hospitalizations as well as absenteeism from school and work.³² The relationship between automobile usage and asthma was demonstrated dramatically during the Atlanta Olympic Games of 1996. During the games, cars were restricted in the downtown area, decreasing automobile usage by 22.5 percent. During that time, asthma-related admissions to the emergency room and hospitals decreased by 41.6 percent.³³

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Other Health Problems Affected by Land Use Patterns

The systems of land use patterns and transportation are integrally connected to health as demonstrated through the above examples. However the web extends even further than physical inactivity (and all related diseases), injuries and respiratory health. Other potential overlapping health effects of land use include such issues as mental health, violence and social capital.

Mental Health and Time in Traffic

Traffic congestion, long commutes, chauffeuring children and other nondrivers to practices, events, appointments and more all add to the stress of daily living. Studies show a 236 percent increase among Americans in time spent in traffic since 1982. Frumkin further notes, "Evidence links commuting to back pain, cardiovascular disease, and self-reported stress."³⁴ The Funders' Network

²⁸ Funders' Network, 2003.

²⁹ Funders' Network, 2003.

³⁰ Frumkin, 2002.

³¹ Michigan Department of Community Health. *Behavioral Risk Factor Survey*, 2001.

³² Frumkin, 2002.

³³ Jackson and Kochtitzky, 2002.

³⁴ Frumkin, 2002.

states, “Existing research points to the considerable impacts of such physical factors as air pollution, noise, traffic, crime and presence or lack of support networks on mental and emotional health status.”³⁵

Social Capital and Land Use

Many researchers have noted the physical and emotional benefits of healthy social connections. Much discussion has ensued about ‘social capital,’ the level of civic engagement and relationship building present where there is a strong sense of community.

Robert Putnam, author of *Bowling Alone: The Collapse and Revival of American Community*, discusses how the physical fragmentation of our lives is directly linked to decreased civic participation. Many people work in different communities than those in which they live. Commutes are longer and 80–90 percent of the time are made alone in a car (up from 64 percent in 1980). Longer commutes leave less leisure time for family, friends and neighbors. Fewer spontaneous connections (bumping into neighbors while walking to work, the post office or a restaurant, for example) create weaker ties to community members. Relationships instead are formed with colleagues who also live farther away, making social time with them a higher investment of travel and further reducing available time for local socializing or involvement.

Putnam argues that the car and the commute are demonstrably bad for community life. He states that for each additional ten minutes in daily commuting time, involvement in community affairs is decreased by 10 percent. “Fewer public meetings attended, fewer committees chaired, fewer petitions signed, fewer church services attended, less volunteering and so on.”³⁶ Laura Jackson also notes that Putnam presents “compelling evidence that many illnesses, including colds, heart attacks, strokes, cancer and depression and premature deaths are inversely related to social and family ties and religious and other group membership,” which in turn are directly impacted by sprawl.³⁷

Land Use and Water – Quantity and Quality

Water quantity and quality are also impacted by land use decisions. As more natural vegetation is cleared and impervious surfaces are built over large areas, rainfall is less effectively absorbed, filtered and returned to groundwater aquifers. Instead, rain water becomes polluted and is then lost as runoff, dumped to streams and rivers and carried away.³⁸

ENHANCED NONMOTORIZED TRANSPORTATION BRINGS ECONOMIC BENEFITS

In addition to the important health benefits of creating environments where people can easily walk and bike, integrating physical activity into routine living also results in significant economic advantages. The cost of infrastructure to support nonmotorized transportation is significantly less than that needed for motorized transportation. Additionally, active transportation results in economic benefits for local commerce as citizens passing by at three miles per hour are much more likely to interact with local businesses than those passing by in a vehicle traveling at 35 miles per

³⁵ Funders’ Network, 2003.

³⁶ Robert D. Putnam. *Bowling Alone: The Collapse and Revival of American Community*. Simon & Schuster, New York. 2000 (213).

³⁷ Laura Jackson, 2002.

³⁸ Frumkin, 2002.

hour. However, one of the most significant financial impacts of the active environment relates to health care costs. In 2000, the total costs attributable to obesity alone (direct medical costs and indirect costs of lost productivity and wages) were approximately \$117 billion.³⁹ At the state level, studies have shown the high medical cost of inactivity. In New York, for example, conservative estimates of medical costs from inactivity ranged between \$3.005 and \$3.76 billion. A mere 5 percent increase in physically active adults would save New York \$183 million per year.⁴⁰

Michigan's Governor's Council on Physical Fitness, Health and Sports has contracted with Dr. David Chenoweth, PhD, FAWHP and President of the Health Management Associates in New Bern, N.C., and a Professor of Health Education and Promotion at East Carolina University, Greenville, N.C., to complete a study for Michigan which will include both total medical costs and Medicaid costs attributable to sedentary lifestyle. Dr. Chenoweth has completed similar studies for New York, North Carolina, and California. The Michigan study will highlight the financial impact of a 5 percent reduction in the number of inactive Medicaid recipients. The study is scheduled to be released on May 22, 2003.

MICHIGAN EFFORTS FOR LAND USE AND HEALTH

In order to help Michigan communities understand the relationship between public health and land use, a number of initiatives have been launched.

Community Self-Assessments

In a strong partnership effort, the Michigan Governor's Council on Physical Fitness, Health and Sports and the Michigan Department of Community Health have created a cutting-edge self-assessment tool for communities. The Promoting Active Communities Award: Community Self-Assessment Inventory helps a community examine whether community policies and facilities promote healthy physical activity. The self-assessment doubles as both an educational experience and an application for a state-level award. The award honors those communities that are making it easier for people to be physically active through their work in policies and zoning, facilities and programs, worksites, schools and public transportation. The application itself is an educational process, which brings together multiple partners from diverse fields as they assess their community environment and learn more than 100 action steps they can take to create a more walkable/bikeable place for their citizens. It is available online at www.mihealthtools.org/communities.

Statewide Conference to Raise Awareness

In addition, the Department of Community Health and 25 state partners, including the Governor's Council are hosting the first annual *Designing Healthy Livable Communities* conference on May 22. In this conference, national experts and Michigan leaders will talk about decisions made by community leaders that make it either easier or more difficult for people to be healthy.

Community Interventions

The Department of Community Health and the Governor's Council on Physical Fitness, are also partnering through a grant to the Council to assist communities as they try to make it easier for people to be active. Five communities are now implementing interdisciplinary collaboration,

³⁹ Funders' Network, 2003.

⁴⁰ Leadership for Active Living. *Leadership Action Strategies: A Primer on Active Living for Government Officials*. San Diego, 2003.

community self-assessment, citizen surveys and community visioning. This process will result in each developing a long-range “active community” plan.

APPROACHES TO SOLUTIONS FOR MICHIGAN

Decisions related to land use and transportation systems clearly play a role in improving public health. Solutions for the issues raised in this paper are not simple.

Transportation Planning Must Support Nonmotorized Modes

Central to any approach to improving land use patterns for health is transportation planning. Unless walking and biking can become safe and convenient enough to be used as modes of transportation, it will be almost impossible for most Michigan citizens to meet minimum physical activity requirements for health. When more people are walking and biking for transportation, automobile usage, congestion, automobile-related injuries and air pollution can decrease. Developing more compact communities that support walking and biking for transportation would help decrease commuting time, increase social capital and preserve green space. All of these add up to higher quality of life, which improves mental health as well.

Other Nationally Recognized Strategies

- **Encourage mixed use, high-density developments with preference toward infill and redevelopment of urban areas.** Strengthening existing urban centers is more likely to achieve reductions in automobile trips and miles traveled than new (even if mixed-use) communities developed in isolation to existing urban services. High-density developments built outside of existing urban areas are likely to meet transportation goals only if they are connected to mass transit. “However, this option requires regional planning, government incentives such as congestion pricing and employer cash-back programs and other transit incentives. While these large scale actions are possible and desirable, more immediate solutions are necessary and more readily attainable by designers and planners at the scale of individual towns, their existing neighborhoods and parcels.”⁴¹
- **Encourage preservation of neighborhood schools.** When children walk to school, there are many benefits beyond health, including improved academic performance, self-image and independence. Furthermore, walking to school provides healthier social development and increases the likelihood that children will grow into active adults.⁴² Current laws discourage the preservation (or development of) smaller community schools and encourage large school campuses outside of the community center, relegating parents and students to motorized transportation.
- **Support Safe Routes to School programs.** Safe Routes to School programs help community members assess the environment around local schools and improve the safety, walkability and bikability of routes from neighborhoods to school so more students have an active commute option. The Governor’s Council on Physical Fitness, with the Department of Community Health, launched a Walk to School Day program in October 2002 and will be introducing Michigan’s first statewide Safe Routes to School initiative this fall.
- **Support comprehensive public transportation.** Improved transit systems help relieve congestion, reduce air and water pollution, revitalize older neighborhoods and extend the range

⁴¹ Jackson, 2002 (8).

⁴² Funders’ Network, 2003.

people can walk and bike to get places. Combining bicycles with transit, for example, increases the service area of transit systems by three to seven miles at very little cost.⁴³

- **Promote pedestrian and bicycle facilities and infrastructure.** A connected network of sidewalks, trails/paths and bike lanes properly designed to provide a sense of protection from traffic and crime, which gives people multiple routes to get to a variety of destinations in a short amount of time is greatly needed across the state. Designing with the pedestrian in mind, since everyone is a pedestrian from the moment of leaving the house or the car, is vitally important. Designing for the most vulnerable populations (children, the elderly and disabled) ensures its functionality for all people.
- **Encourage preservation of green space.** Linear trails provide valuable recreational and transportation opportunities and allow all to appreciate the beauty of the country and to safely cross-longer distances without traffic conflicts. Preserving other open space is essential for improved quality of air and water, preserving farms and locally grown produce, and for enhanced recreational opportunities. The health benefits of green space have been well documented and must be remembered when making decisions about development.
- **Encourage regional planning.** People do not stay contained within the governmental boundaries of their house or their work. They do not limit their use of services and infrastructures only to those within their city or rural township. Pollution, likewise, does not stay contained in the immediate area from which it originated. A trail system that starts and ends in one small community, without being linked to neighboring trail systems has little value for transportation. Public transportation must work effectively across governmental boundaries in order to best serve people. Daily routines are not bounded by the same jurisdiction lines within which local governments operate. Therefore, regional planning is critical to developing a truly pedestrian and bicycle-friendly environment.

SUMMARY

Land use decisions made today will have significant influence on the health of future Michiganians. With cooperation between professional disciplines and across geographic boundaries we can reverse current trends toward sprawl, meet nonmotorized transportation needs and improve the health of our citizens. By better understanding the health impact of all land use and transportation decisions, we can develop a state filled with communities where physically active recreational opportunities abound and where walking and biking for transportation is safe, convenient and enjoyable. Envision this new Michigan. In it, citizens, young and old, will achieve higher levels of health and will enjoy and preserve Michigan's natural beauty for years to come.

⁴³ Michigan Land Use Institute. Fact Sheet #1, *We Can't Build Our Way Out of Congestion: Michigan Can Solve Traffic Problems with Alternatives to Driving*.